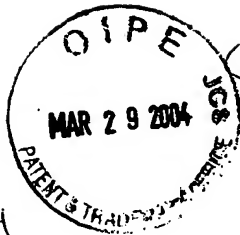


Please amend the paragraphs beginning at page 17, line 22 as follows:

After shaft rotation, target t lies in the $y = 0$ bending plane and the method determines the angle of bending wheel rotation needed to align the tip with t . The transition point q from the shaft to the bending section determines the angle of wheel rotation. As shown in Fig. 6. ~~The~~ the bending movement of the straight tip to the left and right can be approximated by a semi-circle with its center $c = 49$ mm away from the endoscopes end 601. A link Q of the chain can be determined that includes q . The link can be moved along its \hat{z} -axis by $a = 95 - 49 = 46$ mm. The new origin of Q can be considered as the center of the semicircle.

The desired angle of wheel rotation (604) can be given by the angle between \hat{z} (602) and target t (603):

$$\beta = \cos^{-1} \left(\frac{Q'^{-1} t \cdot \hat{z}}{|Q'^{-1} t| |\hat{z}|} \right) \text{ with } Q' = QT(\hat{z}a). \text{ Needle length } d = |Q'^{-1} t| - c.$$



(Proposed Drawing Collection)

504
LA

601

Approximating A Bending Movement By
A Semi-Circle With A Given Center

602

Determining A First Vector Between
The Center And A Tip Of The Endoscope

603

Determining A Second Vector Between
The Center And A Target

604

Determining The Angle Between The
First Vector And The Second Vector

FIG. 6

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